THE VETERINARY RECORD

A Weekly Journal for the Profession.

Edited by WILLIAM HUNTING, F.R.C.V.S.

No. 819 MARCH 19, 1904 VOL. XVI

TUBERCULOSIS COMPENSATION BILL.

The meat traders have a Bill now before Parliament designed to provide for compensation being paid for carcases seized as tuberculous but which showed no sign of disease during life. The Bill is down for second reading on April 15th, and a deputation waited upon the Right Hon. Walter Long to ask for ministerial aid in facilitating its progress. We understand that 200 Members of Parliament have expressed their approval of the Bill. Mr. Long said that "a strong case had been made out, and expressed his sympathy with the trade." All this sounds well, and we heartily hope the meat traders will be successful in obtaining the scanty justice which this Bill would give them. But, we must not be too hopeful. There are a number of cranks to whom the word "compensation" is always a provocation—the House of Commons is not free from them. Then there is the *vis inertiæ* of British Government which blocks everything until an outraged public obtains the assistance of an excited press. There are more ways than one of killing a dog and of blocking a Bill. Courteous sympathy with the object and judicious delay in the proceedings are most effective, as we have been taught by the Board of Agriculture.

SWINE FEVER PROSECUTIONS.

Everyone must have noticed the remarkable increase of prosecutions lately for offences against the Swine-Fever Order. What can be the cause? Has the Board obtained greater assistance from the police or is there a greater number of cases of attempted evasions of the Act?

Of these alternatives we incline to believe that the latter offers the real explanation. The pig-owner is only an ordinary human being and therefore likely to consult his own interests. He also is subject to that common weakness which makes us all resent unfair treatment.

When the Swine-fever Order was passed the principle upon which it was run was to stamp out the disease and assist the owner. Now the principle is to stamp out the disease at the expense of the owner, at the same time that regulations are enforced which tie his hands and half ruin his business. When a man has once had his premises closed and is forced to look on, helpless, whilst 40 or 50 pigs die and are buried, he is not likely again to invite the interference of authority. He fails to understand the pretence that all this is done for his especial benefit, and consequently offends against the Order. We believe the prosecutions are evidence of a very wide evasion of the law, and we believe the evasion is justified. It is theoretically possible to control swine-fever by coercion, but the law must be made more Draconian than now to render such a method successful in Great Britain, and greater stringency without increased help would quickly result in such an outcry that the Order, if not the Board, would have to go.

PREVALENCE OF DISEASE.

The returns this week of glanders and anthrax require no comment—in eleven weeks 314 cases of anthrax and 606 horses attacked with glanders. It would not increase disease much, and it would awaken the Board of Agriculture, if Local Authorities declined to enforce the useless regulations.

MALLEIN AND PURPURA.

When the National Veterinary Association held its last meeting in London the subject of "Glanders" was under discussion.

Among other assertions I ventured to say that I had tested horses with mallein in various cases of disease including purpura, and "without any save a negative effect." Mr. Caton corrected this experience by relating a case of purpura in which he had witnessed marked local reaction, but as the temperature at the time of injection was 104° he could not depend upon the general reaction. At that time the cases of purpura in which I had used mallein were very slight ones—doubtful cases, in which only one or two red spots were seen on the nasal membrane and no swellings about the body. Since then I have had the opportunity of injecting mallein into two cases of well-marked purpura in which the limbs or head were much swollen. In both cases the temperature was so high that no deduction could be made from it in considering the reaction. In both cases very large local swellings followed, but they behaved differently to those caused by glanders infection. In glanders the local swelling goes on increasing after the first 24 hours. In the purpura cases the swellings, though of extra size, commenced to decrease at the 24th hour, and had entirely disappeared by the 48th.

Observations in disease are liable to cause error if an insufficient number of cases are used on which to base an inference. My original statement was misleading, and Mr. Caton's experience was supplemental and corrective. It would be interesting to know if any additional experience is available as to the action of mallein in purpura and whether my more recent observations can be corroborated or contradicted. Of course in the majority of cases no doubt exists as to the diagnosis, but in some cases where the extremity of the nose is swollen and the submaxillary glands are enlarged, doubt may exist, and mallein would help if its action were well established.

WILLIAM HUNTING.

ABSTRACTS FROM FOREIGN JOURNALS.

On the Influence of the Toxin of the Bacteria of Fæces and Extract of Fæces on the Circulation of the Blood.

In order to see whether and how far putrefactive products of intestinal bacteria exert their influence on blood circulation, Marischler undertook a series of experiments with fæces toxins.

The experiments consisted of inoculating in bouillon normal fæces, fæces in obstruction, in diarrhœa, and those of a milk diet, then he filtered the cultures through a Chamberland filter and obtained a filtrate containing toxin. Then M. injected the toxin in the neck vein of rabbits and the femoral vein of dogs and connected one of the jugulars with Ludwig's kymograph.

The conclusions may be summed up as follows: In the filtrate of the bouillon cultures there is a certain toxin which injected into peripheral veins causes increased arterial blood pressure. This raising of blood pressure depends probably on the irritation of vaso-motor centres. This toxin also produces disturbances in the activity of heart muscle itself or its peripheral innervation.

From the fæces in habitual obstruction and in a normal state, the toxin obtained produced a marked effect on the circulation of the blood. An obstruction artificially produced exercised no special influence on the strength of the toxin. The same thing occurred in the fæces of diarrhœa. Several days of a milk diet exercised no influence on the quality and strength of the toxin.

Toxin introduced through the jugular had a weaker effect in vaso-motor centres than if introduced through the veins of the neck. Watery extract of fæces introduced into the neck vein produced a considerable fall of blood pressure.—Ex. *Fortschritte der Veterinär Hygiene.*

G. M.

(This translation may throw some light on the "toxæmia" question if one reasons from analogy.)

Chinese Horse.

Mongolia is the chief breeding district for the horse in China—and there are more than a million there.

The horse is from 12½ to 14 hands high, thick set, strong and coarse, has a wide forehead, straight, somewhat heavy head, small ears, short neck, straight back, wide loins, muscular quarters, short shoulders, deep chest, the legs are strong and clean, joints large and feet well formed.

Light grey, bay, and roan predominate. The pace is irregular and not very easy, generally an amble, temper good. Some are really well shaped, and generally they are useful for military purposes. The Chinese dealers buy at about a pound a leg and sell at £11 to £15 a head, and when they are broken to gallop their value is doubled.

Asses are also common in China and stand 10-1 h.h. to 12 h.h. Mules are numerous and range from 12-1 h.h. to 14-5 h.h. They are well made, quiet, strong and wear well. The pick of them fetch about 35/- a head.—*Rec. Vét.*

Glanders and Glycerine.

Dr. G. Angelici has been carrying out experiments with glycerine as a destroyer of the glanders bacillus, and finds that three days immersion completely destroys the virus. He was led to experiment by the fact that he found some undoubtedly glanderous tissue to be sterile after being sent to him in glycerine.—*La Clinica Vet.*

F. E. P.

SOME OF THE PHASES OF INFLUENZAL COMPLAINTS OF THE HORSE, AND REMARKS ON TREATMENT.

By Henry Gray, M.R.C.V.S., Kensington.

Read at the meeting of the Eastern Counties V.M.A. at Norwich on February 18th.

By the term influenzal complaints, sometimes called typhoid affections, I mean all those forms of disease that have for the primary cause the *Pasteurella equi*. Generically their clinical manifestations are included in the Pasteurellosis[1] of Lignières, or Hueppe's group of Hæmorrhagic Septicæmias. Exception may be taken to this definition as including too much, and not denoting enough of the effect. Yet although the term Pasteurellosis is comparatively new, the idea of the unity of origin of the influenzal complaints is more than a century old. Intelligent observers saw the relationship between the different manifestations, during different outbreaks and during various periods. Then came the time of the pathological anatomist, who saw that in reality different clinical and anatomical entities were grouped with various unlike affections, and this idea has prevailed until our own time. Modern research by strict scientific or experimental means has come to the rescue and harmonises the two sets of ideas. It shows that all spring from a common origin, but some of them have accessory or secondary causes thrown in so as to mask their real nature.

This disease, like disease in general, is the effect of some stimulus acting upon the system. Under various conditions and according to the susceptibility of the individual, and the quantity or quality of the stimulus, the effects vary. But if the cause is specific, and the conditions and surroundings are determined the effect is proportionate to these factors. If all the factors are equal no disease is produced, and we have what is termed natural immunity. Whatever may be the cause and effect of disease, whether it be bacterial, chemical or mechanical, it is essentially a physical process. It is the outcome of the animal adapting itself to its surroundings.

Anything that weakens the body—such as wet, cold weather, changeable weather, overwork, changeable temperature, impure air from overcrowding or bad sanitary arrangements, is favourable to the development of microbes, especially the *Pasteurella equi* and the *streptococcus equi*. Moreover, these microbes are placed in more favourable conditions to develope their toxic

(1) The general characters of the microbes of the genus Pasteurella causing diseases included in this group are given in my paper on Canine Distemper, *vide The Veterinary Record*, December 19, 1903.

properties, which vary in quantity and quality. If they become exalted in great virulence and find sufficient pabulum—susceptible animals under unfavourable conditions—the disease becomes very contagious and rapidly spreads, forming what is generally termed an epizoötic outbreak, which recurs after various intervals from five to ten years, or a panzoötic after a longer interval. If, on the other hand, the virus is not exalted and the general conditions of a whole country are not favourable, but only a district or stable is favourable, we get what we term an enzoötic, which is permanent in many large establishments in large towns. What the conditions of the soil, water, food, and climatic and meteorological influences have, as they undoubtedly have to do with outbreaks of the influenzal complaints I will not pretend to go into, but I will say dampness or wet favours their development, in the majority of instances.

As I have said, these complaints have one primary origin in common, and many of them have also supplementary causes. This primary microbe has been found in the nostrils of healthy horses (2 out of 14, Lignières), but in them it has a low virulence. The commonest supplementary or contributory cause or second infective agent is the strangles streptococcus[2], which is commonly found in the upper air passages of healthy horses, in the soil and in the surroundings of animals. It is a saprophyte. From these facts we can understand why we sometimes get spontaneous outbreaks of influenza, strangles, contagious pneumonia, and various other forms. We can understand why a certain stallion communicates the disease for months and even years. But the disease is generally spread by an animal suffering during the early stage, or which has recovered, or is suffering from a mild form of the complaint, coming from an infected stud or stable. Remount depôts, large horse dealers, jobmasters, etc., studs are never free from it. Many outbreaks in the remote suburbs of London and other large towns are traced to animals from infected studs; even the coach horses that travel from London and put up at country livery stables carry the disease to them. The country horse put up in these stables on a market day or at other times contracts the infection and afterwards develops the disease, leading the local practitioner to conclude that the infection was of spontaneous origin. Many French bacteriologists have investigated some outbreaks of this complaint, which they term "the pneumo-enteritis of forage" occurring in horses, and have come to the conclusion that the fodder was the bearer of the infection, which they considered was of saprophytic origin and did not arise from another case of the disease.

It may not be out of place to mention here that when I was an assistant to a veterinary surgeon in a large colliery practice in the Midlands during 1886-7, he would not allow green fodder to be taken into the pits, as from his experience it had introduced influenza into the mine stables under his charge. That clear observer the late Professor Williams, was a very strong believer in the saprophytic origin of it, and adduced facts to support his argument.[3]

From the above facts I think we may fairly conclude: (1) That the influenzal complaints usually develope from contagion; (2) that they may also, if rarely, originate from natural infection, arising from within the body or without, from the soil, etc.

Once the virulence of the infecting agent has become fixed it is easily maintained in a large assemblage of horses, by the continuous influx of young or susceptible animals from non-infected situations or farms, and thus the disease is always with us. In scattered localities when the disease breaks out it dies out; after a time if no fresh pabulum is introduced to maintain it the microbe is returned to its harmless saprophytic life or dies.

The intensity of the general symptoms, as seen in pink-eye, is not in relation with the local lesions and *vice versâ*, nor is the mortality in relation with the acuteness of the disease, but rather the opposite. Breed and condition are very important factors in the death bill. Large, fat cart horses, out of condition, brought into infected studs and foul hot air[4] have the disease frequently in a per-acute form; they often develop acute hæmorrhagic pneumonia or a milder type of pneumonia, which is not rarely followed by strangles complications, and if death does not take place naturally they either have to be destroyed or sold as unfit for service. The American or Canadian horses just off ship-board are also liable to be seized in these forms.

Locality has some influence on the character of the malady. On this last point I cannot do better than quote the remarks made by the late Professor W. Dieckerhoff, of the Berlin Veterinary School. He says: "Influenza is a country disease, contagious pneumonia a local disease, and contagious laryngo-tracheitis a stable disease."

If these three forms are to be taken as typical of the influenza complaints there are other clinical varieties of all degrees of intensity and having a variety of characters acting as links between them. In them, as in the different clinical varieties of canine distemper, fowl cholera, etc., we can trace the very mild disease simulating a common catarrh, a simple sore throat, a simple attack of fever, etc., up to the acute form, pink-eye, acute hæmorrhagic pneumonia, enteritis, meningitis, with their resulting complications and sequelæ. Only this past week I found in a large stud one case with what we call strangles, another with pneumonia, a third with purpura, a fourth with a so-called cold, and five with typical pink-eye all standing next to one another.

Professor Joseph Lignières, the talented ex-pupil of the late Professor Nocard, after many years clinical and experimental study has established that the equine Pasteurellosis like the Pasteurelloses of the other animal species can be divided into three principal forms according to the course they run. They are as follows:—

1. Septicæmic form (influenza, pink-eye.)
2. Acute or sub-acute form with all its localisations (contagious pneumonia, gastro-enteritis.)
3. Chronic form (progressive pernicious anæmia.)

Mode of Infection.

Intra-tracheal injection determines similar but very much milder symptoms than when the peritoneal culture of the cocco-bacillus is introduced into the vein. All authorities, with the exception of Dieckerhoff, have failed by injecting the blood from a sick animal into a sound one. It appears that the system is infected through the alimentary canal by means of water or food, or from the soil or surroundings. The late Professor Robertson was successful in conveying the

(2) According to Professor Lignières the diplococcus of Schütz, the streptococcus of Schütz, that of Delamotte, Chantemesse, Gal tier, and Violet are one and the same organism.

(3) Williams.—*Principles and Practice of Veterinary Medicine*, p. 359, eighth edition, 1897.

Lignières.—*Etiologie de la Fièvre Typhoïde du Cheval (p. 448, Rec. de Méd. Vét., 30 Aout, 1897)*, states that the influenzal cocco-bacillus may vegetate as a saprophyte in forage, dung, soil, streams, etc., and under unknown causes may become pathogenic.

(4) Warm foul air in a confined stable is very irritating to the mucous lining of the air-passages to freshly introduced animals from the country, and in consequence it predisposes them to develope the infection.

disease to a sound animal by putting it in a stall which a diseased animal had vacated a few days before.

It therefore originates either from *contagion* (or contamination from another sick animal), or from *infection* (or ingestion of saprophytic germs living on the food, grain, or forage, or in the drinking water.)

If the exalted culture of the Pasteurella is injected *subcutaneously* it causes in the horse symptoms of acute influenza (pink-eye), or pneumonia, or pleurisy, or peritonitis, and very often death; the manifestations and severity varying according to the dose, and the susceptibility of the animal. When the culture is introduced into the *vein* (the severest mode of experimental infection), it kills the horse in a few hours with all the symptoms of acute influenza (pink-eye), and in some instances there is enteritis or various degrees of colic. Small doses produce gastro-enteritis (muco-enteritis) with the usual symptoms.

If the animal dies during the early phase of the acute disease the specific Pasteurella is found in the blood and and in the various organs; but if, on the other other hand, death takes place later other micro-organisms, especially the strangles streptococcus, are found in these situations instead. If the infection confines itself to the intestinal canal the Pasteurella manufactures in it the toxins which become absorbed into the system and so depress it that it forms a suitable soil for the growth and multiplication of the strangles streptococcus in the lungs, pleuræ, peritoneum, etc. These phenomena are produced after a slight or temporary action of the Pasteurella, *which has frequently an effaced or masked rôle.*[5]

The Period of Incubation or the Latent Period.

The period of incubation of any of the clinical varieties of the specific cocco-bacillary infection is usually put down as from 3 to 10 days. It is even asserted to be as short as 24 hours. In the majority of instances no doubt these extremes are relatively correct, but not absolutely. In a constantly infected place one cannot always be certain of the period of incubation, as frequently the initial symptoms are overlooked, or may probably have passed off for some time before the complication manifests itself. I have frequently observed that a horse may have been in an infected stud some weeks, or even months, before anything goes wrong with him. It is only when exposed to a "chill," perhaps standing for an hour or so outside a residence awaiting his owner during inclement weather, that he manifests some clinical form of equine Pasteurellosis. Had such an animal the infection within him for a long time and did not exhibit disease until depressed by a chill? I say, Yes. Clinical observation gives evidence of it, experiment confirms it. We know that an animal, for example a stallion,* a dog, a fowl, and even man may be the bearer ot infective germs for a considerable time without showing any disease. We see it in distemper, fowl cholera, pleuro-pneumonia contagiosa of the ox, glanders, tuberculosis, trypanosomiasis (one form in man may have a latent period of from 2 to 5 years,) etc. The chill in presence of an infective microbe is as important in the causation of disease as the germ itself. Furthermore, the chill theory in the causation of disease has stood the test of many centuries! It is an occasional cause.

(5) Lignières.—*Etiologie de la Fièvre Typhoïde du Cheval (Rec. de Méd. Vét., 30 Aout, 1897.)*

* The apparently healthy stallion does not transmit the disease by mere co-habitation but by coitus, but the mare contracting the infection from him generally contaminates susceptible animals coming in contact with her.

The Internal Temperature as Indicated by the Thermometer.

In these complaints of the horse the thermometer is a very valuable guide in ascertaining the state of the animal, even when very few palpable symptoms beyond a slight loss of appetite and perhaps a little sluggishness are present. It is *not an absolute guide.* I have found many horses seriously ill with no abnormal temperature. Some very slight cases have perfectly normal temperatures; others have very high temperatures. I have seen it at 109° F. at night time, and next morning the animal has appeared perfectly well. I have also seen it between 106° and 107° for a week and the cases recovered. The high temperature without grave symptoms is of very little practical importance. Grave symptoms without much temperature in cases that do not appear to run a normal course are of much more importance. If a temperature runs its usual rise and fall within a week or fortnight, afterwards remains normal for a certain period, and then re-ascends, one may safely come to the conclusion that a secondary infection has taken place and that a complication, be it ordinary strangles, mesenteric abscess, pneumonia, effusive pleurisy, purpura, etc., is going to manifest itself, and very probably kill one's patient, or very frequently render it incurable, or at least prolong the duration of the animal's illness. If the temperature keeps high from the commencement to a week or more, and there is during this time very little or no appetite the omen is bad. My experience is that a continuous high temperature for a fortnight from the onset of the illness ends in death or non-recovery. At the approach of death the temperature may ascend to 107 or 108° and continue there; on the other hand there may be a subnormal temperature which may be rapid, or prolonged to some hours before life is extinguished.

Ophthalmic Phenomena.

The symptoms manifested by the mucous membranes of the eyes are generally characteristic in some forms. In pink-eye usually one or both eyelids become swollen, sometimes everted, showing a bright red membrane covering almost the eyeball which seems sunken into it, and tears trickle down the face. Sometimes the eyeball seems to have a meaningless stare as if the animal were unconscious of what was going on around him. In the outbreak of 1889—1901 many cases suffered from iritis with purulent or bloody purulent effusion into the anterior chamber. In a few cases there may be cloudiness or opacity of the cornea, ulceration of which is rarely seen in the horse. In some outbreaks, the conjunctival mucous membrane has in the majority of cases a pale whitish appearance; in others it may show all degrees of yellow tints.

In the contagious pneumonia the conjunctival mucous membrane is nearly always yellowish, and having all degrees of vascularity.

It is believed in many districts where periodic ophthalmia is common that it is the remains of a previous attack of influenza.

Cataract, disseminated choroiditis, hæmorrhage into the retina, amaurosis etc., occasionally follow on an attack of one of the clinical forms of influenza.

From a medico-legal point of view the ophthalmic sequelæ are of importance.

Cutaneous Symptoms.

Skin eruptions are not infrequently seen in these complaints of the horse, and the reason they do not attract much attention is in consequence of the thick coat masking them. In many cases where the animal has not been clipped they cause an upstanding of the hair in patches scattered all over the body; these patches give to the finger a roughened elevated touch.

when the hair is clipped off they have a gummy resinous appearance when recent, and are crustaceous or scaly when old ; they have the diameter of that of a pea or small bean. When the old crust or scale is removed with the nail or spontaneously disappears it leaves a bare hairless patch. There is never itchiness. In other instances the epidermis and hair peels off in large flakes of various sizes leaving bare places on the skin. Occasionally a true pustular eruption is observed.

In the case of strangles complicating these complaints we may get abscesses all over the skin, which contain the strangles streptococcus. This is generally observed in yearlings.

Sometimes the hairs of the mane and tail are easily pulled out, and at other times the hair of the body is shed without desquamation of the cuticle, leaving the skin hairless for some time.

In the acute or pink-eye form edema in various parts is generally observed. Urticaria without purpuric spots may also occur.

In the complication purpura we also see urticariform circular or oval flattened elastic eruptions as well as the irregular lumpy swellings scattered all over the body. These and the sometimes enormous diffuse swellings seen under the body, legs, throat, and head are not likely to be confounded with the above mentioned cutaneous lesions.

Respiratory Phenomena.

The influenza virus may attack the nostrils, guttural pouches, larynx, trachea, bronchial tubes, lung substance, or pleural covering, and may cause temporary alteration of the tissues and speedy recovery, or in many instances secondary infections due to various microbes, especially the strangles streptococcus, take their place in these depressed tissues and prolong the duration of the localised lesion.

In the acute form (pink-eye) I have frequently observed that when the external swellings were resolving the bronchial mucous membrane became the seat of catarrh. At other times the lung became the seat of acute congestion, which usually passed off early and ended in recovery, or occasionally passed on to acute hæmorrhagic pneumonia and afterwards gangrene. In this acute pneumonic localisation the specific cocco-bacillus or *Pasteurella equi* is usually found in great numbers in the blood and pneumonic tissue. If the attack is slight the pneumonia is more liable to pass on to hepatisation, with or without pleurisy, and recovery in the non-pleuritic cases is from 90 to 99 per cent. in most outbreaks. On the other hand the process may run on to suppuration or even necrosis or gangrene of the lung substance, with or without effusion, which is mostly of a putrid purulent nature, into the pleural cavity or cavities.

Sometimes a small patch or patches of the lung, of the size from a pea to a walnut or duck's egg, or even larger becomes necrosed and the animal apparently recovers until, perhaps, he is subjected to hard work or great exertion when he suddenly develops urgent pneumonic symptoms and putrid breath, and dies from putrid pneumonia, with or without putrid pleurisy, and on post-mortem examination one finds a patch of necrotic lung. The thermometer is no guide during this latent period. Such cases as these are of great importance from a medico-legal point of view. One must not run away with the idea that all cases of putrid pneumonia with fœtid breath are from an old standing lesion resulting from a previous attack of pneumonia. These latter usually develop suddenly, whereas putrid pleurisy and putrid pneumonia not arising from a previous lung attack develop slowly and manifest stinking breath towards the end of the case. Fœtid breath may occur in pneumonia and pleurisy with no necrosis discernible on post mortem. In this case it is due to putrescence of the fluid products in the diseased tissues.

As a rule pneumonia, and its frequent accompaniment pleurisy, that runs a normal course and ends in absolute recovery gives the animal great immunity to future attacks. However, this is not absolute but only relative. One sometimes sees a recurrence within three to six months, and perhaps death takes place without any old standing lesions of the previous attack being present. Again, I know that a horse may have as many as three attacks within six months and recover, and do hard work for years after. It was asserted a year or two ago that one attack of pneumonia predisposed an animal to future attacks. My experience is that it is not so. Prof. M'Fadyean, and I believe also Mr. Hunting, are of the same opinion. Prof. Lignières says it is "generally admitted that a first attack confers immunity."

These pneumonias, with the exception perhaps of the very acute congestion arising during the early stage of pink-eye, are due to the strangles streptococcus. In the gangrenous or necrotic patches the bacillus of necrosis has been found. A frequent cough, usually absent in many respiratory localisations, is always present when the seat of the disease is confined to the larynx and trachea. Animals sometimes assume the recumbent position when suffering from lung localisation.

According to Prof. Lignières the Pasteurella is found in horses not only affected or dead of contagious pneumonia but also with pleurisy, pleuro-pneumonia, the so-called strangles pneumonia, influenza pneumonia, broncho-pneumonia, contagious sore throat[6], stable pneumonia, and even pneumonia *per se*. It is often but not always in these cases associated with the strangles streptococcus, the latter after a time predominating over the former. He says the streptococcus only plays a secondary *rôle*[7]. Prof. M'Fadyean is of opinion that the cause of common catarrh of young horses in London and other large towns is due to streptococci and is contagious. He says hot air has nothing to do with its development. On this last point I do not agree with him, as general experience of a century or more has shown that the malady is fruitful in hot, ill-ventilated, overcrowded stables, and that on the other hand the disease is very mild or recovery takes place quicker if animals are placed in well ærated places or even turned out into the open.

Abdominal Phenomena.

Frequently the alimentary canal becomes the seat of catarrh accompanied or not with constipation-colic, which is often the first thing to attract attention, and the real nature of the cause is mostly overlooked. In some of these instances, after the disappearance of abdominal symptoms pneumonia sets in, or even gangrene of the lung without the early signs of this complication being observed. At other times we find patchy or diffused enteritis ; occasionally, hæmorrhagic extravasation between the mucous and serous layers of the bowel, and in rare instances ulceration of the mucous membrane after colicky symptoms have manifested themselves before death. I have seen intense intestinal agony, which nothing would allay, after the remission of thoracic symptoms of pneumonia. On post-mortem examination, beyond the pneumonic consolidation I found petechiæ along the course of the serous membrane and patchy congestion of the mucous membrane of the intestine. Enlargement of the mesenteric gland in the vicinity of the stomach, due to streptococcic infection complicating the cocco-bacillary infec-

(6) Lignières.—*Contribution a l'Etude des Pneumonies du Cheval (Deuxième note). Rec. de Méd. Vét., 30 Aout, 1897.*

(7) M'Fadyean. — Proceedings National Veterinary Association, London, 1902.

tion, often followed by rupture of the stomach, is not rare.

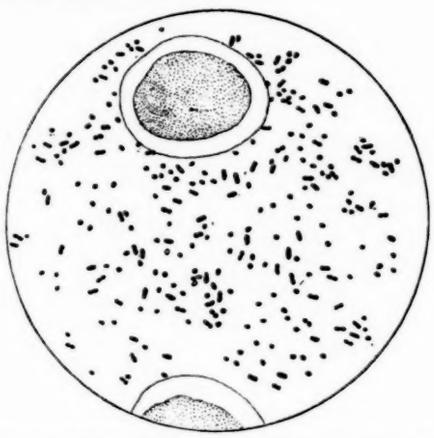
I have nowhere found mention of another obscure form of abdominal influenza. During the last ten years, on several occasions I have been suddenly called in to see a horse noticed to be ill a few hours before. Perhaps the horse was apparently well overnight, but next morning was found to have refused its food, breathing rapidly, dull, and sleepy, and when moved had a staggering gait, and, in one instance when the head was held up, fell dead, or in other instances had assumed the lateral recumbent position which it maintained until death speedily closed the scene. Those cases of this sort that I have had a chance to observe during life have had a very deeply injected conjunctival mucous membrane, distended nostrils, and an anxious expression. When the abdominal cavity is opened the first thing to attract attention is the outflow of an amber-tinted serous fluid, and on further examination I have found intense infiltration, with this same amber-coloured serum, of the subserous membrane along the meso-colon, meso-rectum, under the loins and around the kidneys. There are also petechiæ on the serous surfaces of the abdomen, chest, peri- epi- and endo-cardium.

Differential Diagnosis between the Influenzal Cocco-Bacillus and the Bacterium of Schütz.[8]

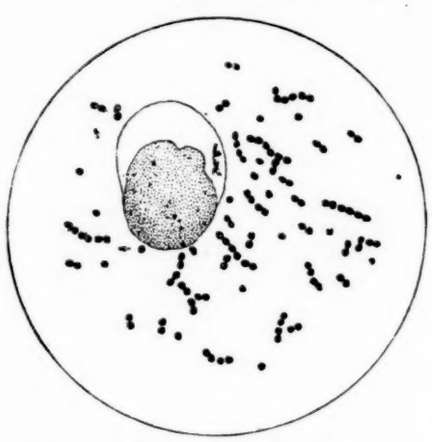
Influenzal Cocco-Bacillus.	Bacterium of Schütz.
It shows itself in the form of cocco-bacilli (fig. 1) smaller than the bacterium of Schütz.	It shows itself in the form of monococci, diplococci or streptococci, but never in bacilli (figs. 2 and 3).
Is never stained by the method of Gram.	Stains very well by the method of Gram.
Never forms streptococci in liquid media.	Grows in the form of streptococci in liquid media.
Ærobic.	Aero-anærobic.
Never acidifies peptone bouillon; does not coagulate milk; does not ferment lactose.	Often acidifies peptone bouillon; coagulates milk; ferments lactose.
Grows well upon gelatine between 18-20 deg.	Grows badly upon gelatine between 18-20 degs.
Easily kills the guinea-pig, rabbit, and horse by subcutaneous inoculations.	Does not kill the guinea-pig, rabbit, and horse by subcutaneous inoculations under ordinary conditions.
Is easily transformed into vaccin.	Is not transformable into vaccin.
Cannot grow in the filtered culture of the strangles or pyogenic streptococci.	Grows in the filtered culture of the influenzal cocco-bacillus.

Suppurative Foci.

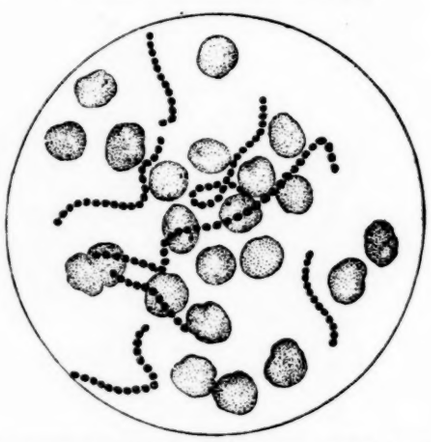
As I have already said, the strangles streptococcus is found normally, as a saprophyte, in the upper air passages of healthy horses and also in their surroundings, such as the soil, mangers, and fodder. There is no wonder it frequently complicates the pasteurellic infection; and beyond causing pneumonia in some cases and various lesions in others, it also forms suppurative foci in the various lymphatics, chiefly the sub-maxillary and retro-pharyngeal glands, but not rarely in the mesenteric glands, and occasionally those of the axilla and groin, and the ischio-rectal and sub-lumbar glands. At other times, especially in yearlings, it may give rise to innumerable abscesses scattered all over the skin. These suppurative foci or infiltrations are also found in the lungs, and the pleural cavity is sometimes filled with streptococcic pus. Occasionally the joints and bursæ become the seat of suppuration. In the case of the pre-carpal bursa the suppurative process may afterwards infect the elbow joint and give rise to a suppurative arthritis. The hock-joint and also stifle-joint may occasionally become infected. The streptococcic purulent infection may spread to the meninges and substance of the brain and sometimes of the spinal cord. The stallion has also conveyed the cocco-bacillary infection to the mare which has also developed streptococcic lesions causing death.



Influenzal Cocco-bacillus or Equine Pasteurella, Peritoneal Serosity (Guinea-pig.)



Bacterium of Schütz in the form of diplococci. Peritoneal serosity (Guinea-pig.)



Bacterium of Schütz in the form of streptococci. Pus from an abscess (Horse), obtained by the subcutaneous injection of the diplococci form of Schütz's bacterium.

Illustrations from *Recueil de Méd. Vét.*

(8) Lignières.—*Etiologie de la Fièvre Typhoïde du Cheval. Rec. de Méd. Vét., 30 Aout, 1897.*

When we find that the temperature, which has descended and regained the normal and remained there for a few days or longer, rises again, we may safely come to the conclusion that streptococcic infection is going to complicate the primary infection, and probably render our case hopelessly incurable if the brain, lungs, pleuræ, or the mesenteric glands are the seat of its location. On the other hand, if the situation of the suppurative process is near the surface of the body, or if purpura is the result, a recovery is very often obtainable.

Nervous Phenomena.

In acute influenza the nervous system seems to be intoxicated, if we judge by the stupor, inco-ordinated movements, relaxed anus, and often dilated rectum. As in the dog, we may get myelitis, meningitis, and epilepsy, but these are very rare. In the streptococcic complication we sometimes observe purulent meningitis and myelitis of the brain, or even of the spinal cord, with resulting coma, amaurosis or paralysis of varying degrees, especially in foals. Serous meningitis with an accumulation of fluid in the arachnoid sac of the brain, giving rise to symptoms of immobility, is occasionally seen in young horses in some country districts. The common nervous sequelæ of the cocco-bacillary infection and its complicating streptococcic infection we see in the form of roaring, shivering, and occasionally stringhalt. Perhaps some gentlemen present will say these are hereditary affections. The tendency is hereditary, but this tendency remains latent until some determining cause, such as the cocco-baciliary and streptococcic infections, calls it into play. I have also frequently observed this in the dog. A bitch having had chorea, epilepsy, or paralysis after distemper gives births to pups that when the time comes for them to have distemper, also develop similar phenomena. It is the same in the human subject. Indeed, some neurologists view many of the so-called hereditary nervous complaints as due to infection *plus* hereditary tendency. Again, are not the various clinical varieties of the influenzal complaints dreaded by large purchasers of young light-bred horses as being a cause of roaring, and in consequence greatly reducing the value of their stock? It is the same with shivering; newly purchased cart horses brought into London and put into an infected stud occasionally develop shivering. The sequelæ may develop early after the attack or at a remote period.

Are the so-called cases of epizootic cerebro-spinal meningitis and the infectious paraplegia special forms of equine Pasteurellosis?

Arthritic and Tendinous Troubles.

Occasionally, after the various clinical varieties of the Pasteurellic infection, as in other infections, especially after certain outbreaks, we may observe effusion into the tendinous sheaths, or into the bursæ, or even into the true articular cavities, which may give rise to troublesome lameness, or, when the effusion is of a purulent nature, even death. The connection between the primary complaint and its complication or resulting sequel is frequently overlooked. These troubles have been experimentally produced by injecting the virulent virus into the veins, consequently experimental evidence harmonises with clinical observation. This form has been described by some authorities as the rheumatic type of influenza. Although no joint in the body may be exempt from its attack it usually prefers in the cart horse the tarsal serous cavity, or in the light bred horse the sesamoidal synovial cavity.

Periostitis.

In some rare instances of distemper outbreaks I have observed periostitis of the phalangeal bones of the dog, but I do not know whether it has been observed in the horse after influenzal complaints. Yet I can say that in some studs during the spring of the year splints are often epizoötic.

Obscure Lameness.

After influenza, pneumonia, or sore throat, obscure lameness, may be not rarely encountered in well-bred horses. The lameness may be continuous or intermittent but recovery after a variable time is the rule. Frequently luxation of one or both patellæ is observed. Congestion of the laminæ occurs sometimes, and may be the cause of death.

Cardiac, Renal, and Hepatic Disturbance.

Occasionally the walls of the heart become affected with cloudy swelling of the muscular fibres, giving the organ an appearance as if boiled, at other times it is affected with acute or chronic myocarditis or fatty degeneration. Now and again the epicardial serous membrane, like its opposing parietal serous membrane, becomes the seat of all degrees of inflammation, with or without serous or purulent effusion. The endocardial surface, especially in the vicinity of the free edges of the valves, semi-lunar or mitral, right or left, also becomes the seat of inflammation, simple, ulcerative, or vegetative. In the acute stage of the primary infection, and sometimes in the early stage of the secondary infections, we frequently see petechiæ or ecchymoses on the external or internal lining, and even within the muscular substance of the heart.

When the heart is attacked with active disease or the endo-cardial surface with acute ulceration great danger is to be feared from sudden death, or in the case of non-ulcerating endocarditis if not sudden death from a thrombus, chronic lameness or brain or lung disturbance from the thrombus shifting or becoming located in some important vessel.

Exceptionally we see acute parenchymatous nephritis, which may pass off or may degenerate into a chronic disease giving rise to albuminuria, chronic swelling of the legs, sheath, etc., anæmia, emaciation and incapacity for work. We may also see acute catarrh of the bladder. It is not rare to find that the urine contains a great quantity of mucin, giving the urine a thick consistence resembling that of linseed oil. Hæmorrhage into the areolar tissue around the kidneys and under the loin may be now and again seen.

In the liver, especially if it is already the seat of amyloid degeneration, we may witness hæmorrhages which sometimes cause death by rupture of the capsule. At other times the liver is friable and granular, or even very much congested. It is said that the jaundiced appearance of the mucous membranes in these various phases of the Pasteurellic complaints is due to catarrh of the common bile duct. This I don't believe.

The Effect on the Pregnant Mare and the New-Born Foal.

I have very often noticed that a good many unsuspectedly pregnant mares sent into London abort, or if they carry to full term that the foal is born dead, or if born alive is weakly and rarely survives. I look upon it as a sequal to the dam becoming infected in her new and afterwards always infected surroundings.

I verily believe that the septic arthritis or the acute diarrhœa of new born foals is due to infection arising during their intra-uterine life or becoming infected during birth. Frequently mares, especially those that are well cared for and not subjected to changes during pregnancy, suffer from a slight form of influenza, without any elevation of temperature, a short time before pregnancy. This is overlooked or put down to some slight temporary ailment of *no importance*. (In the study of disease these so-called "no importances" are often real

importances). Yet the foals being infected do not show the symptoms of ordinary influenza! The weakest spot yields to the secondary infections and we get navel ill. Be this as it may, peracute hæmorrhagic septicæmia may occur in the foal, with all the strictest antiseptic precautions taken at the time of its birth.

Some have stated that infection does not take place during intra-uterine life, but from observation of this disease in pregnant mares and its parellel in other species I believe this not an exact statement. Even in the human subject the child is sometimes born with small-pox. In the fowl infection takes place sometimes through the egg; in the rabbit the passage of the infection from the mother to the fœtus has been proved experimentally, and from clinical observation in the cat, dog, and mare this mode seems very probable. Conclusions should not be drawn from one or two negative experiments, especially if the mother died a few hours after the inoculation. I have seen influenza and also strangles in foals under a fortnight. Nocard made post-mortem examination of a foal born dead and found strangles lesions, Choisy, Mègnin, Wiart and others have encountered similar phenomena. Inflammation of the bowels has been found in the aborted fœtus of the mare suffering from influenza.

Purpura Hæmorrhagica.

Purpura hæmorrhagica, also termed anasarque, scarlatina, petechial fever, scarlet fever, is a complication of the cocco-bacillary infection. It is thought to be due at times to the *streptococcus pyogenes*, and at other times to the strangles streptococcus. Out of 46 young horses inoculated with 2 cubic centimetres of a culture of the equine pasteurella with the object of immunising them, one died seven days after manifesting all the usual symptoms of purpura; 13 others showed more or less marked symptoms of this disease, and one of them died on the 18th day following the commencement of the complaint. From this and many other similar facts observed both in France and in the Argentine, Lignières and also Even consider that purpura belongs to influenza or its various clinical manifestations. The streptococcus pyogenes plays an important part in its production, as shown by the influence of Marmorek's original or monovalent anti-streptococcic serum in the cure of some cases of purpura. On the other hand, this serum had no influence on other cases of the complication, and this fact among other things led Lignières to conclude that purpura was due, in some instances, to the strangles streptococcus.[9] If sero-therapy or sero-diagnosis is a valuable guide in determining the specificity of the causal microbe this conclusion of Lignières is correct, as since Marmorek, on the suggestion of Dr. Roux, introduced several varieties of streptococci derived from different sources into the manufacture of a polyvalent anti-streptococcic serum this disease as well as strangles in its earliest stage is aborted and cured with this new serum.

Although it is generally stated to originate from various causes I believe it has a specific origin and that it is not a disease *per se*. It is true that no premonitory symptoms of influenza or strangles are observed in some instances, but I am of opinion that these are overlooked. It may occur in horses regularly worked and well seasoned as much as in unseasoned animals if all are equally susceptible when exposed to the cocco-bacillary infection. So far as my experience goes it seems to be much more fatal to light-bred animals than to coarse, heavy bred animals. Occasionally it is liable to recur, or at least an animal is liable to a relapse of it. It may manifest itself without developing any external lesions. I have on several occasions seen it kill within 24 hours. Sometimes in these rapid cases it is accompanied with acute paraplegia and even rabiform symptoms. A sudden diminution of the external swellings, or colicky symptoms, or rapid breathing, is a fatal sign. Recovery may take place in mild cases without any treatment. My experience agrees with that of the late Prof. Williams inasmuch that it more often occurs in animals kept in dark stables.

Treatment.

The treatment of these complaints is divided into preventive and curative. The former is again subdivided into (1) isolation and *true* disinfection, and (2) into immunisation.

Immunization is either active or passive. It is termed passive when we use an antidotal or curative serum, and active when we use a vaccine or preventive inoculation. The Messieurs Lignières have introduced a *Polyvalent vaccine*[10] to render not only the horse but also the ox, calf, pig, sheep, dog, rabbit, and fowl immune against the pasteurelloses. The vaccine is composed of the different varieties of the pasteurella belonging to the different species of animals, cultivated in an artificial medium. There are the 1st or weak vaccine, and the 2nd or strong vaccine. Both are injected under the skin, allowing an interval of 12 or 15 days between the two. One of these gentlemen, Monsieur Joseph Lignières, along with his assistant, M. Spitz, have also introduced a *curative serum*[11] which, when injected into the vein in doses of 40 to 60 c.c., produces abatement of the symptoms and recovery in a few days. It is useful in acute influenza with high temperature and pneumonia, and in contagious pneumonia. It is said to be also useful in canine distemper when used early and before secondary infections have taken place.

For the strangles and also the purpuric complications, as well as in pneumonia, the *polyvalent anti-streptococcic serum*[12] of Marmorek was highly recommended by the late Professor Nocard a few weeks before his lamented death. It must be used early, and in the case of strangles before the suppurative stage is reached. It is also used in the streptococcic infection complicating distemper in the dog. I think this polyvalent anti-streptococcic serum is well worth trying on valuable horses affected with streptococcic complications, especially purpura and strangles. M. Rohr, Vétérinaire-Majeur in the 17th Artillery (French), recommends as an ordinary dose the following: Three phials each 10 c.c. of the serum the first two days, morning, noon, and night; two phials for two or three days following.

Fresh air, a clothed body, cleanly surroundings, and a light diet, as scalded hay, bran mash, carrots, and green food when in season, comprise the essential treatment in the greatest majority of cases. They are absolutely necessary. Drugs play very little part in the restoration to health without them. The animal must not be worked nor exercised too soon after the convalescent stage. More horses are killed or rendered incurable by working them during the early stage of disease or too soon after the convalescent stage than by the primary infection.

If medicinal agents must be given in these complaints they should be simple and harmless. The old idea was

(9) Professor Lignières divides the streptococci into two groups; he takes the streptococcus pyogenes as the type of one group and the streptococcus of Schütz as the type of the other. *Vide* "*Etude de la Paraplégie du Cheval*," *Recueil de Méd. Vét., 30 Décembre, 1898.*

(10) J. et M. Lignières.—*La Vaccination contre les Pasteurelloses (Académie des Sciences, 20 Mai, 1902.)*

(11) Lignières et Spitz.—*Un Sérum polyvalent préventif et curatif contre les Pasteurelloses (Académie des Sciences, 9 Juin, 1902.)*

(12) Nocard.—*Application du Sérum Anti-streptococcique au traitement des affections gourmeuse. (Rec. de Méd. Vét., 30 Juin, 1903)*

to give a diaphoretic, such as spirit æther nitrosi with the solution of acetate of ammonia. To my mind this cannot be surpassed. Some people are fond of magnesium sulphate given in 3 or 4 oz. doses and repeated often. This no doubt acts well by neutralizing the toxins in the alimentary canal, and also by removing a great number of the saprophytic and perhaps pathogenic microbes with the pultaceous fæces. When there is fear of acute intoxication the intravenous or subcutaneous injection of a 7 : 1000 solution of sodium chloride is beneficial by acting as a vascular stimulant, as an antiseptic and as a powerful diuretic. In the earlier stage of pneumonia carbonate of ammonia is very useful, not only as cardiac stimulant but also as an anti-clotting body; furthermore, it is an excellent stimulant to the appetite but is somewhat of a laxative. The only objection to it is that it is necessary to give it in a capsule. Large doses may be given safely by these means—as much as 3 or 4 ounces daily, although no useful object is obtained by giving such large quantities.

Iodide of potassium is highly recommended by some as an antipyretic, an antiseptic, and an absorbent in pneumonia and in purpura. It is also largely used to prevent roaring. Professor Trasbot recommends it to be given along with digitalis and sodium salicylate. In purpura, when the breathing is very frequent and rapid, I have seen iodide of potassium reduce the number of respirations from 70 or 50 to the normal within five or ten minutes after an injection of a watery solution into the jugular vein.

Sodium bicarbonate has the property of increasing the bactericidal action of the blood; it neutralises the toxins, acts as a diuretic, renders the blood more alkaline, and soothes inflamed mucous membranes.

Digitalis is a cardiac tonic and a diuretic, and it, like sodium chloride, sodium bicarbonate, iodide of potassium, ammonia carbonate and alcohol, has the power of preventing the blood clotting. It is used along with strychnine or nux vomica and æther in heart failure. My experience is that it is of no value in the treatment of the horse.

Quinine is largely but needlessly used as an antipyretic and a tonic in the influenzal complaints. I have not seen any advantage in its use unless hypodermically injected in small doses to increase the defensive activity of the cells to resist the potency of the secondary invasions. It must be used early in the complaint and in small doses.

Sodium salicylate is preferable to all the other drugs in the treatment of the various clinical forms of the influenzal complaints. It acts as a neutraliser of the toxins, inhibits the action of the microbes, lowers temperature, and acts as an analgesic, especially in rheumatic pains and stiffness.

Local Treatment.

This consists of rubefaciants and vesicants, poultices or hot or cold swabs, or belts. After an extensive use of the hot water swab or belt to the chest I have abandoned it and returned to the mustard application, which although empirically used acts according to the teachings of science, and, moreover, answers in practice. It is necessary to use it in the early or congestive stage of inflammation so as to get a reaction—a swelling. If there be no swelling resulting from it it is frequently a bad omen, at least that is my experience. However, the majority of horses suffering from pneumonia will recover without, and many are worse with local treatment.

In the treatment of pharyngitis or laryngitis, or laryngo-tracheitis, biniodide of mercury ointment is frequently applied to the throat, with the object of preventing roaring as much as reducing the local inflammation. I think mustard is better as it acts more sharply.

Biniodide of mercury or cantharides ointment is sometimes applied to the chest wall in the chronic form of pleurisy or pneumonia. If no reaction is obtained symptoms of poisoning, such as gastro-enteritis, urinary irritation, etc., are likely to develop. If mustard does not answer neither of these will.

Tapping the Chest in Pleural Effusion.—My experience of tapping the chest in pleural effusion is that all those cases that recover after the operation has been performed would have recovered without it, and all those cases that die after tapping meant to do so from the first. Still, it is possible for a recoverable case without tapping to become a fatal case after tapping.

For reducing the immense swellings of the muzzle, head, and under the abdomen occurring in purpura, one part of oil of turpentine added to three parts of linseed oil rubbed on the parts two or three times a day seems to act admirably.

Gentlemen, the subject matter that I have had the honour of presenting to you should be of the greatest importance not only to the veterinary profession and the horse owner, but to the State. To my mind this group is of far more importance than all the other diseases of the horse put together. Its various forms are always with us, it appears everywhere, and its effects occasion great loss by death, by the frequent entire loss of working power, and by the temporary loss of the services, which, in its total, is enormous, and is especially noticeable in armies and in large studs.

Bibliography.

Brown, S. Epidemic of Spring, *Veterinarian*, 1828.

Langsworthy. On Pneumonia, *Veterinarian*, 1829.

Darvill, R., V.S. 7th Hussars. "On the Distemper," p. 82, A Treatise on the English Racehorse, 2 vols., 1828, and *Veterinarian*, p. 55, 1830.

Blaine, D. P. Veterinary Art, 5th edit., 1841.

Spooner, W. C. Treatise on Influenza of the Horse.

" " Edition of White's Farriery, 1842, art.: Influenza.

Youatt, Wm. The Horse, edited by by E. N. Gabriel, 1860; art: Epidemic Catarrh.

Percival, Wm. Hippo-pathology; arts: Influenza and Strangles, vol. i, 1853; Diseases of the Chest and Air Passages of the Horse, part i, vol. ii, 1853; Epidemic Fever, p. 216, *Veterinarian*, 1832.

Castley, J., V.S., 12th Lancers. Strangles, p. 427, *Veterinarian*, 1830.

Ferguson, H. Epizootic among Horses, *Veterinarian*, p. 241 1841.

Williams, Wm. Principles and Practice of Veterinary Medicine, 8th edit., 1897; Influenza. *Vet. Journ.*, p. 73, Aug., 1891, vol. xxx.

Robertson, Wm. Equine Medicine, 1883.

Pritchard, Wm. Influenza, *Vet. Journ.*, p. 50, vol. xxi, 1885.

Briggs, A. W. Epizoötic Influenza. *Vet. Journ.*, p. 438, vol. xxvi, 1888.

Hunting, Wm. Putrid Pneumonia in the Horse, *Vet. Record*, p. 362, vol. ii., 1889-90.

Malcolm, J. Outbreaks of Influenza, *Journ. Comp. Path. and Therap.*, p. 48, vol. ii, 1889; Outbreaks of Strangles *Ibid*, p. 359, vol. i, 1888.

M'Fadyean, J. Influenza of the Horse, *Ibid.*, p. 105, vol. ii. Editorial Criticism on Contagious Character of Strangles, p. 355, vol. i; Editorial Criticism on Cause of Influenza, p. 249, vol. iv, 1891; Editorial Criticism on the Propagation of Influenza from Stallion to Mare, p. 46, vol. i.

Smith, Fred. Pneumonia and Pleurisy, pp. 13, 97, and 315, *Journ. C. P. & T.*, vol. vii, 1897.

Dollar, J. A. W., Villar, S., M'Fadyean, J. Pneumonia, *Proceedings of National Veterinary Association*, London, 1902.

Fleming, Geo. Infectious Pneumonia of the Horse, *Vet. Journal*, p. 1, July, vol. xxx., 1891.

Wilson, A. Influenza and Sudden Death in a Mare, *Vet. Journ.*, p. 95, vol. xxx., 1891.
Law, Jas. Veterinary Medicine, vols. ii and iv.
Pottie, Alex. Propagation of Influenza from Stallions to Mares, *Journ. Comp. Path. and Ther.*, p. 37, vol. i., 1888.
Clark, Jas. Transmission of Pink-Eye from apparently Healthy Stallions to the Mare, *Ibid.*, p. 261, vol iv., 1892.
Reeks, H. C. Transmission of Pink-eye from Stallion to Mare, *Ibid.*, p. 513., vol. xiv., 1901.
Over, Reg. Transmission of Pink-Eye from Stallion to Mare, *Vet. Record*, p. 450, Jan. 17, 1903, vol. xv., 1902-3.
Grimme. Transmission of Influenza by the Stallion, *Vet. Record*, p. 734, May, 1903, and *Deutsche Thier. Wochenschrift*, p. 102, No. xii, 1903.
Chaussé. Transmission of Strangles from the Stallion to the Mare, *Rec. de Méd. Vét., 30 Juillet, 1900.* Also see art: Gourme; Nocard et Leclainche, Les Maladies Microbiennes des Animaux, 3rd edit., vol. ii, 1903.
Choisy and Nocard.—Transmission of Strangles from the Mare to Fœtus, *Vet. Journ.*, p. 182, vol. xxvii. 1888, and *Journ. Comp. Path. and Ther.*, p. 170, vol. i, 1888.
Martin.—Etude sur la Pyogénie Specifique appelée Gourme du Cheval.
Cadéac.—Du domaine de la fièvre typhoïde, *Journ. de Méd. Vét. et Zoot, Mai*, 1897.
„ Pathologie Interne des Animaux Domestiques, vol. vi, 1897. Arts: Fièvre Typhoïde; Gourme; Anasarque.
Bigoteau. Notes on Strangles, p. 285, *J. C. P. & T.* vol. vi.
Leclainche, E., et Joly, G. Cutaneous Strangles, p. 43, *J. C. P. & T.*, vol. vii.
Trasbot. Typhoïde (Fièvre), p. 55, vol. xxii, 1894; Poumon (Pathologie), p. 21, vol. xviii, 1890, *Diction. de Méd. Vét. de Bouley.*
Zundel, A. Typhoïdes (Affections) p. 650, vol. iii., 1877, Influenza (Grippe) p. 306, vol. ii., 1875, *Dict. de Méd. de Chirurg. et Vét.*
Bourgés. Epidémie de Grippe, p. 227, No. xii, 30 Juin, 1899. Sur l'influence du froid dans l'étiogénie de la pneumonie du cheval, p. 337, No. xvi, 30 Aout, 1901. *Rec. Méd. Vét.* Le Sérum de Marmorek contre l'anasarque consécutive à la pneumonie infectieuse. *Revue Vét.*, Mai, 1900.
Bougés et Cadiot. Pleuro-pneumonie contagieuse du cheval, p. 361, No. xx, 30 Oct., 1899, *Rec. Méd. Vét.*
Pécus. Epizootie de pneumo-enterite infectieuse chez le jeune cheval. *Rec. de Mém. et. obs. sur l' Hygiéne et la Med. Vet. Milit., vol. xx, 2e Série.* Réflexions sur le traitement de l'anasarque dite symptomatique par le sérum antistreptococcique. *Journ. de Méd. Vét. et Zoot.* Dec., 1900. Relation de deux epizooties de Pasteurellose équine, par M. Nocard, p. 338, No. xii, 30 Juin, 1902, *Rec. Méd. Vét.*
Querruau. Une Epizootie d'Angine et de Pneumonie, p. 268, No x, 30 Mai, 1900. *Rec. Méd. Vét.*
Cagny. Sur l'affection du cheval dite "mal de chien" p. 67, No. iv, 28 Fév., 1900, et p. 774, No. xxii, 30 Nov., 1900; Sur la gourme et sur quelques maladies analogues, p. 40, No. ii, 30 Jan., 1902. *Rec. Méd. Vét.*
Guillemain et Cadix. Pneumonies Infectieuses, p. 175, 30 Avril, 1901. *Rec. Méd. Vét.*
Leclainche, E. Influenza (La Grippe). *Vet. Journ.*, pp. 81, 171, 131, 398, vol. xxxvi., 1893.
Darmagnac Ch. Septicémie hémorrhagique foudroyante des poulains nouveau-nés, p. 373, *Rec. de Méd. Vét.*, 15 Juin, 1903.
Rohr. Epizootie de laryngo-trachéite Typhoïde, *Rec de Méd. Vét.*, 30, Oct., 1897.
Lignières, J. Contribution a l'Etude des Pneumonies du Cheval (Première note), p. 335, No. xii, 30 Juin, 1897. *Rec. de Méd. Vét.* (Deuxième note), p. 450, No. xvi, 30 Aout, 1897, *Ibid*, and also *Journ. Comp. Path. and Ther.* p. 312, vol. ii, 1898. Etiologie de la Fièvre Typhoïde du Cheval, p. 437, No. xvi, 30 Aout, 1897, *Ibid.* Streptocooques et sérum de Marmorek, p. 719, *Ibid*; Recherches sur l'etiologie de l'anasarque active ou idio-pathique, p. 22, No. xxii, 30 Nov., 1898, *Ibid.* Contribution á l'étude de la paraplégie du cheval, p. 744; Nouvelle contribution a l'étude de la Pasteurellose équine, p. 849, No. xxiv, 30 Dec., 1898, *Ibid.* A propos de la paraplégie du cheval, p. 465, No. xv, 15 Aout, 1899. Contribution à l'étude et à la classification des septicémies hæmorrhagiques, p. 329, No. xii, 30 Juin, 1900, *Ibid.* Pasteurellose équine p. 524, No. xiv, 30 Juillet, 1900. *Ibid.*
Nocard. Application du sérum anti-streptococcique au traitement des affections gourmeuses, p. 303, 30 Juin, 1903, *Rec. Méd. Vét.*
Schütz, J. W. Strangles Streptococcus, p. 191, 289 *J. C. P. and T.*, vol. I, 1888.
Zschokke, E. Purpura Hæmorrhagica, p. 21, *J. C. P. and T.*, vol. ii, 1889.
Bartke. Complications and Sequelæ of Infectious Pneumonia, p. 295, *J. C. P. and T.*, vol. iv., 1891.
Taylor, Henry. Observations on the Pasteurellosis of the Horse, p. 416, Jan. 2, 1904, *The Veterinary Record*, vol. xvi.

The PRESIDENT said they were all very much indebted to Mr. Gray for this very scientific and interesting paper, and he would like members to discuss it, although he did not think they would be able to complete the discussion at that meeting.

Mr. WRAGG said that so many interesting points were raised in the paper that he felt they could not discuss it at the present stage. He wished to see it first in print. He therefore moved that the discussion be deferred until their next meeting.

Mr. F. THURSTON seconded, and this was agreed to on the understanding that the Committee had a free hand in regard to arranging for Prof. M'Fadyean's lectures so that the two matters did not conflict.

Mr. J. SIMPSON said it might not fall to his lot to have the pleasure of being present when the discussion took place, but all present on that occasion would like to join in an expression of thanks to Mr. Gray for the treat he had given them in connection with this mighty subject, for mighty it undoubtedly was. The ground covered furnished food for discussion not only for one but for several meetings, and they would have to curb their tongues when they next met or they would not be able to close the discussion in a reasonable number of hours. He moved that they accord Mr. Gray a very hearty vote of thanks for his paper.

Mr. A. S. AUGER seconded, and the vote was carried amid applause.

Mr. GRAY made brief acknowledgements.

Mr. SHIPLEY next proposed a vote of thanks to the President, who he said was the right man in the right place, and the Society was very much indebted to him for what he had done for them.

Mr. SMITH seconded this resolution, which was cordially adopted.

The PRESIDENT, in reply, said he was only too pleased to do what little he could in a humble way for the Society. As they had placed him for a second year in his honourable position, he would endeavour with renewed vigour to carry out his duties and try to perform them during the second year rather better than he had done in his first year.

The members dined together before separating.

HARRY P. STANDLEY, *Hon. Sec.*

The New Army Warrant.

Gaceta Med. Zoologica reproduces *in extenso* the new warrant without comment, but evidently as an object lesson for the Spanish Authorities.

A CONTRIBUTION TO THE DIAGNOSIS OF HEARTWATER IN CATTLE.

By Dr. THIELER, Government Veterinary Bacteriologist.

Heartwater in cattle is commonly spoken of in certain parts of the Transvaal as a disease probably similar, if not identical, with the Heartwater in sheep and goats, the main symptom being the enormous filling of the heart-bag with a clear or yellowish fluid.

Thanks to the investigations of Dr. Hutcheon and his assistants, we have gained considerable knowledge about the nature of Heartwater in sheep and goats. Mr. Lounsbury, Entomologist of the Cape Colony, has made clear the mode of spreading and dissemination of the disease. The above mentioned gentlemen have also demonstrated that heartwater in sheep and goats is transmittible to calves.

I propose to describe the chief characteristics of this inoculable disease. From my own observations, it would seem to be often, perhaps in the majority of cases, mistaken for some other maladies in cattle, it probably represents one form of gall-sickness, and, as will be seen from the description of the symptoms, probably what is known as "Dronkgall-sickness."

I propose to describe the chief characteristics of this inoculable sents one form of gall-sickness, as will be seen from the description of the symptoms.

Before entering on a detailed description of several cases of heartwater in cattle, it will be necessary to speak shortly of the disease of the same name in sheep and goats, and to quote facts which have been ascertained in connection with it.

CAUSE OF THE DISEASE.

There is no doubt that heartwater is due to a micro-organism which enters the blood streams of animals. This opinion is based on the fact that the disease is easily communicated by inoculation with the blood of sick or recently recovered animals into healthy susceptible ones, from sheep to goat and cattle, and *vice versâ*. Blood seems to contain the virus under all circumstances, the disease is easily transmitted by subcutaneous inoculation, and more easily by injection into the jugular vein. The liquid of the heart-bag seems to fail to produce the disease in the majority of cases; anyhow, it failed in all my experiments. This indicates that the microbe has to be looked for in the blood, particularly in the red corpuscles. Up to the present every investigator who has conscientiously worked on the subject has failed to demonstrate this micro-organism, either by the microscope or by culture. These facts indicate a remarkable similarity between heartwater and horse-sickness. As far as I am aware, it has not yet been demonstrated that the virus of heartwater passes through a Berkefield or Chamberland filter, as is the case in horse-sickness; on the contrary, experiments seem to indicate that such is not the case. Therefore, the size of the micro-organisms should come within the limit of visibility. Heartwater is one of the diseases which we cannot yet diagnose by the microscope, and the diagnosis will often be impossible, because the characteristic clinical symptoms are wanting, sometimes difficult, and then only based on circumstantial evidence.

After the inoculation of blood from a sick animal into a healthy one a certain period is required to lapse before any symptoms in the infected animal are observed. This time usually lasts from eight to ten days. It may be in exceptional cases as short as five days and as long as 15 days. The disease itself may run on from two to six days and even more.

SYMPTOMS OF HEARTWATER IN SHEEP AND GOATS.

The first sign is always a rise of temperature. This may be the only symptom, and the animal suddenly dies, although it seemed to be quite healthy. Usually, however, the fever keeps on rising, and may reach 106 deg., 107 deg., and even 108 deg. Fahr. The sheep or goat may then stop feeding, become prostrated, and dies without any typical indication of its suffering from heartwater. A good many cases, however, sometimes show symptoms before death of a brain affection so pronounced, indeed, that one is struck by the idea that the name of "Brainwater" would better fit the disease than the one by which it is now known. For instance, a constant movement of the lower jaw, as if chewing something, is noticed, a constant movement of the tongue may be observed, extending and withdrawing it continually. In other cases the animal may be seen licking the ground. It continually turns around the post to which it may be tied, and all of a sudden drops to the ground; fits set in, the neck being extended backwards, and the legs kept in regular motion. These symptoms may pass to return, then they indicate the approach of death. Some of the animals bleat some time before they die, others pass away quietly.

The symptoms of the digestive organs may vary greatly. There is sometimes foam at the mouth, the throat may be slightly swollen, rumination may stop even before feeding; the bowels are usually normal, but in some cases the animal is slightly costive, and again, diarrhœa may be present.

The symptoms may thus vary considerably, but I wish to lay particular stress on the symptoms caused by the diseased condition of the brain, as described above, because, as it will be seen later, a striking resemblance occurs in cattle, whether they are artificially infected with the disease, or whether they contracted it naturally.

POST-MORTEM LESIONS.

The principal lesion in heartwater of sheep and goats is the increase of liquid in the heart-bag, which condition gave the disease its common name. This liquid coagulates easily soon after the bag is opened, and is sometimes even found coagulated in post-mortem of some standing. The liquid is as a rule clear, but it may also be found blood-stained. It must be borne in mind here that not every excess of liquid in the pericardial sac has to be interpreted as being due to the malady in question. Cachectical condition of the body, due to bad pasture, infections by internal parasites, and other causes may produce a similar collection of liquid. Here, however, one has nearly always to do with a poor carcase, whereas the same symptom in a good-conditioned animal points to the specific disease.

The pericardium itself is usually thickened, and has a gelatinous character, both in aspect and structure. In other cases, both the liquid in the bag and the derangement of the pericard may be missing.

The endocard (inner lining) of the left heart cavity has usually a mottled appearance caused by blood spots, sometimes the hæmorrhages are present in streaks and also in patches. The blood is generally well coagulated, the clot of normal consistency and colour. There is also liquid found in the pleural cavity, which behaves similar to the one found in the heart-bag. The lungs are often in a dropsical state, full of liquid in the inter-lobular tissue, which may be found distended, and there is then foam present in the bronchial tubes, and even the windpipe.

The abdominal organs may be found in a quite healthy condition. The spleen is in the majority of cases slightly enlarged, and its pulpa is slightly softened. The liver may be fonnd in a state of congestion, dark in colour, the gall bladder distended by a viscid, thickish green or yellow bile. The kidneys are sometimes also in a hyperæmic condition, which is indicated by the red colour of a section of that organ. The bladder may be full or empty, and the urine is always clear.

The intestinal tract shows different variations in the different cases. The third stomach may be found dry or soft, the mucous membrane of the stomach and bowels may be quite normal, but sometimes lesions of slight catarrh or even of a hæmorrhagic inflammation are present. These conditions are indicated by a redness of the mucous membrane, which may be general, in streaks, in patches, or in form of a stronger filling of the blood vessels, and forming then a distinct arborization or tree-like appearance. The whole extension of the intestines, part or parts of it, may be involved in this pathological change. The membrane is usually thickened in such parts, and even a gelatinous infiltration of the mesentery belonging to it may be present. I have even noticed in exceptional cases that the mucous membrane of the lower part of the small intestine had become necrotic, and that the cæcum and colon had an exudation of blood on the surface. This is, certainly, however, a rare occurrence.

Geographical Distribution of Heartwater.

Heartwater of sheep and goats is met with only in a certain part of the Transvaal, namely, in the Bushveld. There sheep and goat breeding of high bred animals is impossible, and only the common Kaffir goat and fat-tail sheep are found in any number, probably because these breeds have in the long run of time become immune. Not all parts of the Bushveld are, however, equally bad, the worst ones are certainly the lower lying, and therefore also warmer, countries. The season, also, has some influence, inasmuch during the summer-time the disease is in such parts more prevalent and virulent. Heartwater is a malady which seems to stick on the veld. The Boer farmers know that since ages, and, accordingly, when an outbreak occurred in their flocks whilst they were in the Winter Veld a rapid change of field was made, when the disease would soon come to a standstill. They also know that heartwater is not contagious, and once a flock was out of a heartwater-field, up again in the High Veld, and mixed with other sheep or goats, such animals would not take the disease. We know now how to explain all these facts, thanks to the investigations of the Cape experts, especially Mr. Lounsbury. Heartwater is found ia certain parts of the Cape Colony, namely, in Albany and the surrounding districts, where sheep breeding has nearly come to a standstill. Mr. Lounsbury found that heartwater is carried by a certain species of tick, namely, the Bont Tick. In a series of most careful experiments, he has time after time reproduced the disease. In the last issue of this "Journal" the above-mentioned gentleman has, in his paper on "Ticks and African Coast Fever," already indicated how the disease is communicated. Suffice to repeat, that the disease does not go from the female through the eggs, but is taken either by a larva or nympha from a sick animal and communicated in one of the following stages, either as nympha or then as an adult. Mr. Lounsbury was kind enough to send me heartwater infected nymphal ticks from Capetown. These were placed on goats in the Daspoort Laboratory, and the result was that all the goats infected contracted and died of heartwater in the stables, which they never had left.

Every careful observer knows that the Bont Tick is an inhabitant of the Bush Veld, and that, although it may be brought with cattle from that part into the High Veld, and even stick on an animal for a considerable length of time, yet it does not breed there. In the neighbourhood of Pretoria we find it already behind the Magaliesberg, whereas it is not found on this side of the range. The Bont Tick breeds only in warm fields, and where it finds protection in the bushes.

Heartwater is met with in the same parts of the Transvaal where the Bont Tick is found.—*Transvaal Agricultural Journal.*

PARLIAMENTARY.

London County Council (General Powers) Bill.—Compensation for Slaughter.

In the House of Commons on Thursday, March 10.

Sir E. Strachey (Somerset, S.) moved an instruction to the committee of the London County Council (General Powers) Bill to insert provisions in the Bill to safeguard the interests of owners of cows suspected to be suffering from tuberculosis of the udder. These required that before slaughter the milk of the suspected cows should be submitted to the medical officer of health for the county for bacteriological examination; that in the event of slaughter a veterinary surgeon should be present, and that if he should certify that the cow had not been suffering from the suspected disease, the Council should pay, in addition to the compensation provided in the Bill, special damages for the loss of the cow, not exceeding 50 per cent. of the full value of the cow immediately before slaughter. It was also proposed that if the veterinary surgeon certified that the cow was diseased, compensation should be paid in the manner provided by part (*a*) section (3) of the Diseases of Animals Act, 1894, and the Council should bear half of the reasonable costs incurred in carrying out the purposes of the slaughter clause. Further, it was to be provided that the value of a cow slaughtered by the Council, whether diseased or not, should be assessed by a valuer appointed by the Board of Agriculture and not by a veterinary surgeon. The hon. baronet explained to the House that he brought the instruction forward as Chairman of the Parliamentary Committee of the Central Chamber of Agriculture, and only after a failure to induce the County Council to negotiate with him in a friendly spirit. The total number of cows kept in the County of London was something like 4,700, and it was a constantly-decreasing number. If 1 per cent. of these cows were proved not to have tuberculosis after they had been slaughtered, and if the County Council paid the 50 per cent. as special damages, on the value of £20 per cow, the amount involved would be only £470. If they paid 25 per cent., which he was quite ready to accept, the sum would be only £235. That was not a large amount—less, he supposed, than the County Council paid in lawyer's fees for the promotion of Bills in Parliament (cheers)—but it was a matter of great importance to the dairymen in the area of the county of London. The Board of Agriculture should have protected the interests of agriculturists in this matter instead of leaving a private member to move this instruction.

Sir H. Maxwell (Wigton), speaking as the Chairman of the Royal Commission on Tuberculosis of 1895, said there was a great difference between generalised tuberculosis and localised tuberculosis. The hon. baronet did not seem to have realised that tuberculosis of the udder was one of the rarest forms of the disease in cows. It was not until the disease had become generalised that it appeared in the udder, and it could then easily be recognised by any one skilled in veterinary science. Therefore there was no question of suspecting a cow of having tuberculosis of the udder. He admitted that it would be a great hardship if a farmer had three or four cows taken from his dairy and slaughtered, but compulsory power to slaughter was only given when the disease of the udder existed, and a case in which three or four cows were suffering from tuberculosis of the udder was unheard of. Therefore he could not understand why the hon. baronet took such extreme objection to Clause 34. It was rash to assume from Prof. Koch's change of front that there was no danger of infection from the interchange of the tubercular disease between bovine animals and man. That question was *sub judice*, and they should not anticipate the verdict by declaring that there

was no risk of infection. A very small percentage of cows exhibited tubercular disease in the udder, and, as the disease was easily recognised when it appeared in that organ, there was small risk of the slaughter of a cow on mistaken grounds.

Mr. BURNS (Battersea) denied that the London County Council had taken up a *non possumus* attitude in this matter. Immediately that body found it necessary in the discharge of its statutory and sanitary obligations to 5,000,000 of people who wished to have pure milk they introduced these clauses into their General Powers Bill. Instead of the County Council having been peremptory and discourteous, the contrary was the case. When the Dairymen's Association asked for a *locus* the authorities of the House declined to recognise it, but the County Council took no objection to the application. They contended, however, that the House of Commons was not the proper tribunal to go into these scientific details, but that they should be considered by a committee. (Hear, hear.) The County Council had inserted clauses providing that, if after examination the veterinary surgeon certified that a cow was not infected, the County Council should pay to the owner the full value of the cow before it was removed for slaughter, as certified by such veterinary surgeon, as well as the reasonable cost of any independent veterinary surgeon employed for the purposes of the section; while, if after examination the animal was certified to be suffering from tuberculosis, the Council should pay such damage the owner might have sustained from the removal or slaughter of the cow as the veterinary surgeon should certify, together with half the reasonable cost of an independent veterinary surgeon. He contended that these clauses met every reasonable case, and if there was any suspicion that they did not the committee upstairs would exercise their discretion and make them reasonable and fair. (Hear, hear.)

Sir C. RASCH (Essex, Mid.) said that he was in favour of compensation in this matter up to a 10 per cent. limit, but not up to 50 per cent., because he knew that if farmers secured the latter it would only make them unpopular.

Sir W. FOSTER (Derby, Ilkeston) said the greatest weight must attach to the speech of the right hon. baronet, the chairman of the Tuberculosis Commission, and its whole tendency was in favour of sending this matter to a committee upstairs to be investigated there by the help of expert evidence. The late Sir George Thorne Thorne, who was principal medical officer of the Local Government Board, had collected evidence which went to show that while tuberculosis had lessened in this country in other directions, it had increased among young children, and that was very largely due to the sale of contaminated milk. One of the easiest methods of contamination would be by using the milk of cows with tuberculous udders. Evidence was gradually growing to show that in this matter of the communication of bovine tuberculosis to the human subject that eminent scientist, Dr. Koch, was mistaken, but while the matter remained very largely *sub judice* at present, it ought not to be used as an argument for refusing thorough investigation to this Bill. (Hear, hear.)

After some remarks by Mr. GRAY (West Ham, N.)

Mr. J. W. LOWTHER urged the House to allow the Bill to follow the ordinary course. The Police and Sanitary Committee were specially qualified to deal with such matters. If the example of the London County Council were followed by other municipal authorities it would be desirable to have a set of clauses drawn up applicable to all cases. It was impossible for the House to draw such clauses, and it could not have the assistance of the Board of Agriculture and the Local Government Board, which was available to the Police and Sanitary Committee.

After some further discussion, the House divided, and the numbers were—

For the instruction	...	...	57
Against	...	...	195
Majority against		...	—138

—*The Times.*

THE REGISTRATION OF STALLIONS.

Lord Onslow, President of the Board of Agriculture and Fisheries, received at the House of Lords, on Tuesday, March 8th, a deputation from the Hunters' Improvement Society on the subject of unsoundness in stallions.

Lord Yarborough, in introducing the deputation, said that the society was established to improve the breed of hunters and other horses used for riding or driving and for military purposes. They desired to make the registration compulsory of all thoroughbred stallions and hunters or half-bred sires travelling for the public service, in order to prevent the spread of hereditary disease. They suggested that certificates of soundness should be granted annually until a stallion was ten years old, and that veterinary inspectors should be appointed by the county councils.

After other speeches, including one from Lieutenant-General Sir John Fryer, who stated that, as a purchaser of remounts for the Army for many years, he found that 80 per cent. of the horses presented were unsound,

Lord Onslow said that the matter was not only of importance to the agricultural interest, but of Imperial importance in the matter of remounts for the Army. Unfortunately, to make this penal legislation effective they must be supported by the great body of agriculturists, and there were differences of opinion as to the remedial measures necessary, and also as to whether they were required at all. They heard a great deal about protection and free trade, and it had been one of the doctrines of the Board of Agriculture that, whatever else they wanted in the way of free trade, they did not want free trade in disease, but that had always been applied to the question of the importation of disease from abroad. Now the deputation wanted protection against their fellow subjects, and if a man travelled about with an unsound stallion he was to be subjected to pains and penalties. That was a novel departure in our legislation and one which could scarcely be undertaken without very careful consideration and with something like a certainty that they would carry with them the great majority of those who owned horses. The Royal Commission on Horse Breeding, which had considered this matter, suggested that no prizes should be given to any horse unless the exhibitor of that horse was able to produce a certificate that its sire had been found to be sound by a competent veterinary surgeon, and they were further of opinion that it would be desirable to have a large number of prizes for foals begotten of sires with the required certificate. In that or some other way, the Board of Agriculture hoped to meet the views of the deputation.—*The Times.*

Anthrax Carcase in Liverpool.—£50 Fine.

At the City Police Court on Thursday, March 10th, Thomas M'Keever, a cattle dealer, of Callon, Drogheda, was summoned for having exposed for sale in Liverpool meat which was unfit for human food. Mr. Trubshaw prosecuted, and Mr. Rudd defended.

Inspector Webster deposed that on February 17 he went to the shop of Mr. John Moore at the abattoir, Trowbridge Street, and there found four quarters of a bullock infected with anthrax. The meat was totally unfit for human food. The bullock had been forwarded to Mr. Moore by the defendant.

Cross-examined by Mr. Rudd: Mr. Moore offered to have the meat inspected. The bullock was a very fine one.

Other evidence as to the diseased state of the meat was given.

Mr. Rudd said the defendant was a very large grazier in Ireland, and had never before had a case of anthrax. The meat was sent with the full knowledge that it was to be thoroughly examined in Liverpool before being sold. Mr. Moore never offered any meat for sale without its having been examined by an inspector, and this meat was there for the purpose of inspection. He (Mr. Rudd) submitted that there had been no exposure for sale, and that his client had acted in perfectly good faith.

Mr. Stewart remarked that if those interested in the case wished to take some steps to get this question of exposure finally settled, they had better approach the authorities and ask them to assign a separate place in the abattoir to which might be consigned any meat about which there was any doubt, and in regard to which it could be indisputably asserted that it was a place from which nothing was ever sold. He could not accept the statement in this case that the meat was not intended for sale because it happened to be in a particular part of Mr. Moore's shop.

Thomas M'Keever, the defendant, was called. He stated, in reply to Mr. Rudd, that he saw the bullock before it was sent to Liverpool. It was ill, but he understood the reason was that it had been over-fed. If he had sent the bullock to the Drogheda Market, it would never have been suspected, but he always sent meat about which they had a doubt to Liverpool, because he knew that it would always be inspected here.

Mr. Stewart: Inspectors are not here to assist you in carrying on your business. They are detectives—to protect the public.

Cross-examined by Mr. Trubshaw: The bullock was nearly dying when last defendant saw it.

Thomas Moore, in reply to Mr. Stewart, said that when he received the beast he did not know there was anything the matter with it, and he received no communication regarding its condition from the defendant.

Mr. Stewart said that evidently there was nothing to have prevented the beast being sold in Liverpool without the slightest suspicion having been aroused. When a man sent to the Liverpool market a bullock which was evidently ailing from something the least he might do was to communicate with the person to whom it was being sent for the purpose of sale. The defendant must pay a fine of £50 and costs. He was lucky that he was not being sent to gaol.—*Liverpool Post.*

DISEASES OF ANIMALS ACTS 1894 TO 1903.

SUMMARY OF RETURNS, WEEK ENDING MARCH 12, 1904.

Period.		Anthrax.		Foot-and-Mouth Disease.		Glanders (including Farcy)		Rabies. Cases Confirmed.		Swine Fever.	
		Out-breaks	Ani-mals.	Out-breaks	Ani-mals.	Out-breaks	Ani-mals.	Dogs.	Other	Out-breaks.	Slaughtered *
Week ended March 12, 1904 ..		16	25	..	..	39	76	..	..	23	134
Corresponding week in 1903 ..		12	23	..	..	27	44	..	..	15	50
Corresponding week in 1902 ..		10	32	..	..	21	34	1	..	30	97
Corresponding week in 1901 ..		13	15	..	..	22	36	1	..	69	425
Total for 11 weeks, 1904		228	314	..	..	306	606	..	..	280	1698
Corresponding period in 1903 ..		170	273	..	..	251	466	..	..	281	1261
Corresponding period in 1902 ..		175	318	..	..	232	453	6	..	348	1909
Corresponding period in 1901 ..		139	198	10	652	264	485	1	1	470	2457

NOTE.—The figures for the Current Year are approximate only. * As Diseased or Exposed to Infection.

Board of Agriculture and Fisheries, March 15th, 1904.

Death from Glanders.

An outbreak of glanders has occurred amongst the pit ponies at Cramlington, Northumberland. Several animals have been destroyed, and work is suspended. A man named Hills contracted the disease and died. Over 500 men and lads are temporarily out of employment—*Liverpool Echo.*

"Undesirables" and the Handling of Meat.

At last meeting of the Swansea Corporation Sanitary Committee the Veterinary Inspector reported that "undesirables" had frequently the handling of carcases at the slaughterhouse, and he suggested registration and the issue of badges. The matter will come before the Corporation in due course.

Personal.

MACLAREN—BRYCE.—At 54 St. Vincent Crescent, Sandyford, on 8th inst., by the Rev. D. M. MacIntyre, Finnieston U.F. Church, assisted by Rev. Donald M'Corquodale, Queen's Park Parish Church, and Rev. James Buchanan, Greenock (cousin of the bridegroom), John Hogg MacLaren, M.R.C.V.S., Brooke, Norfolk, to Marion Findlay Bryce (May), daughter of the late John Bryce, timber merchant, Paisley.

ROSE.—On the 25th Feb. Gertrude, the wife of Capt. C. Rose, A.V.D., at Kirkee, India, from dysentery after a fortnight's illness.

At the London Arms Hotel, Glasgow, on the 9th March, Mr. JAMES MONTGOMERIE, M.R.C.V.S., was entertained to dinner by a large circle of friends and presented with a handsome gold hunting keyless English lever watch, albert and appendage on the occasion of his leaving Glasgow where he has assisted Mr. Imrie for the last few years. Mr. Imrie occupied the chair.

We are pleased to see that Mr. MARSLAND, M.R.C.V.S., of Darwen, the Borough Veterinary Inspector, has been honoured by being sworn in as a Justice of the Peace.

[We are at all times pleased to receive intimations for this column, and in reply to several enquiries we may say that no charge is made—nor ever has been—for their insertion.]

The Prof. Power Testimonial Fund.

	£	s.	d.
Amount already acknowledged	7	6	0
"His first Monitor"	1	1	0
Tylney Haigh, Esq., Bedford		10	6
Tom B. Bindloss, Esq., Long Sutton		10	6

As the above Fund is to be closed at the end of this week, the Secretary would be glad if any more past students of Dr. Power desirous of contributing would do so at their earliest convenience.

W. A. BROAD, *Hon. Sec.*

Royal Veterinary College, Camden Town, N.W.

ARMY VETERINARY DEPARTMENT.

Extract from *London Gazette.*

WAR OFFICE, PALL MALL, March 11.

IMPERIAL YEOMANRY (Fifeshire and Forfarshire).—Vet.-Lieut. (Hon. Vet.-Lieut. in the Army) J. McL. Young to be Vet.-Captain.

CORRESPONDENCE.

TOXÆMIA.

Sir,

I do not think the addition of the word "puerperal" to "toxæmia" as suggested by "Luna" has anything to recommend it. "Puerperal" is a very long word, longer even than "toxæmia" and "lacteal," besides it only apparently describes the time of day when the affection occurs.

What I, and I venture to say most others, want to get at is a scientific name (and the shorter the better) giving some clue as to the exact cause of the disease. Personally I am of opinion, from clinical observation, experience, and reading that the seat of the disease is a dual one associated with the udder and the digestive tract, and perhaps with two or three toxins derived from these two sources. Hence I can get no further than "toxæmia" at present.

There are toxins derived from the bacteria of dung and dung extract, and these toxins occur in obstruction of the bowel and even in constipation, and exert deleterious effects on blood pressure, and vaso-motor centres.

G. MAYALL.

[Exact names can only be given when exact knowledge of pathology is attained. Meantime one term is as good as another so long as it does not mislead.—ED.]

PERMANGANATE OF POTASS IN MILK FEVER.

Sir,

I was very pleased to see Mr. W. F. Wilson's note on this subject in your pages last week. When I read Mr. F. T. Harvey's paper and remarks at the Western Counties V.M.A. meeting (pp. 450-52: Jan. 16) I was inclined to write to you to ask if any other member had tried this drug—here, in a large town, I do not see a milch cow sometimetimes for days together—but

> "The daily toil, the ceaseless care
> That track us everywhere"

as usual, prevented me.

Mr. Harvey says—"I think injection of air of great importance, as effecting an oxidation within the udder." And again, "Milk fever and its allied conditions probably all result from the presence in the udder of a toxin which finding its way into the blood stream acts on the great nerve centres. That any errors of metabolism in the mammary gland will quickly react on the cow there can be no question." Mr. S. Beeson also says that his father regarded the complaint as directly connected with "errors of metabolism." Again, "The Doctor Sahib" (p. 488, Jan. 30) points the moral—and adorns the tale—where he relates the experience of the farmer who "turns the b— out on the moor for a month before calving, and they and I have forgotten what 'the drop' is." It is an elementary fact in—shall I say Practical Physiology, that fresh air and exercise are valuable agents in the correction of "errors of metabolism" in the human economy; and it is an equally elementary fact in chemistry that Pot. perm. is a powerful oxidiser. Hence I am inclined to think that Mr. Wilson's suggestion is worth notice on the part of the country practitioner. But if it is tried I think it should be tried fairly, *i.e.*, that notes should be taken as to duration of the illness before and after administration of the drug, of the strength of solution used, etc., so that a just comparison may be made. Hitherto our endeavours have been almost wholly tentative—scientific only in their desire for the truth. Some day we may stumble upon a specific remedy—and then have some chance of finding out what takes place within the udder.—Yours faithfully,

SOUTH COUNTRY.

DEHORNING CATTLE.

Sir,

"Country Vet's." enquiry has brought forward a reply by "Possum" which, from considerable experience with this operation, I cannot endorse.

On some of the large cattle stations in Australia thousands of cattle have been dehorned, and the machine in universal use is the "Leavitt Dehorner" (illustration enclosed). I know one station which dehorned all cattle (including aged bulls, Shorthorn and Ayrshire) when it was cut up into dairy farms. The method of operation is as follows: The cattle are yarded, and a few at a time are run into a crush, the leading bullock or cow is forced into a bail and the lever is drawn preventing it from going back, then a special lever is drawn on top of the animal's neck and the throat is forced into a Y shaped piece of timber driven into the ground—this latter lever prevents the animal from moving its head, and the dehorner is worked from the front without trouble. On this station some thousands were operated on, and only one died, the cause of death being hæmorrhage. The cut is made close to the head, and the after treatment consists in a dab of tar. The instrument is a heavy one, and requires a tall powerful man to use it effectively because the arms are at first wide apart; with a strong man the horn is taken off with one cut and the animals do not suffer a great deal, as the following will show: Over 130 cows in milk belonging to one farm were dehorned. Prior to operating and for some days afterwards the milk (in bulk) was tested for quantity (by weight) and quality (Babcock test), a very slight falling off was noticed in both for the first 24 hours after operating, but not more than one would expect as the result of the yarding interfering with feeding and the ordinary general routine of their lives, so that the inference drawn was that the operation is not severe, and will not diminish to any appreciable extent the quantity or quality of milk.

I have seen cattle go straight from the crush and commence feeding, in fact this is the general rule, and the bleeding, which is severe at first, slows down in five minutes and generally ceases in 10 or 15 minutes. Unfortunately the operation has now been declared illegal, and quite recently one stockowner was prosecuted and fined, but for all that dehorning is still going on. The benefits derived are obvious to all—the cattle are more docile—they cannot punish one another, and in yarding and trucking more animals can be dealt with, and when packed they are harmless.

As to the fee I can say nothing, as most of such work in Australia, including spaying and gelding, is performed by station hands—generally the manager. I have used, and seen others use the saw, but it's a beastly slow painful operation, the dehorning machine is bad enough, but it's quick and makes a clean cut. The proper time to dehorn is before an animal is two weeks old, and the Perfection Calf Dehorner is said to be much better than caustic potash.—Yours etc.,

"PREFERENTIAL TRADER."

"VETERINARY POLITICS."

Sir,

Mr. Trigger in his address (*Vet. Record*, vol. xvi, p. 564) eulogized on the great and true men "who brought the R.C.V.S. into being," but he did not allude to any who have tried—but luckily failed—to damage it. We believe the late Dr. Fleming started *The Veterinary Journal* to combat something of this sort.

Did Mr. Trigger wish to insult some of his *confrères* on the Council when he said: "The Election of Vice-Presidents was done in such a slip-shod manner as to reduce the whole thing to an absurdity. He (Mr. Trigger) would undertake to say that neither Mr. Wragg nor Mr. Mason, both of them Members of the Council, could write down the names of the six Vice-Presidents at the present moment. (Laughter.) He himself could not tell them two." Mr. Wragge said: "I know four." Mr. Mason: "I will be honest (what a brave warrior), I don't know one!" Can we believe it? If so, more's the shame!! And are Members of Council, who are "honest" in such a direction, worthy to represent us at all? Fancy Members of Council admitting *in public* that they did not know the Vice-Presidents *of their own selection*. One can hardly credit it. Why did Mr. Trigger go out of his way to make such a statement? Perhaps he considers our V.P.'s such small, insignificant nobodies, quite unfit for the dignity of V.P.'s, although they are all Members of Council elected by the profession, before the Council (Messrs. Trigger, Wragg, and Mason included) could elect them.

For their edification we will remind them who they are, then perhaps they won't forget them during the remainder of their term of office:

A. E. Mettam, Principal R.C.V.S., Pembroke Rd., Dublin.
J. R. U. Dewar, ,, Dick V.C., Clyde St., Edin.
Charles Allen, 35 North Frederick St., Dublin.
G. A. Banham, 15 Downing St., Cambridge.
J. H. Carter, Burnley, Lancashire,
James F. Simpson, J.P., Maidenhead, Berks.

Some of them are quite as well known, and certainly as fit and competent, as any other Members of the Council to fill the position of V.P.

Why should these "honours" be kept in a small little circle every year as apparently Mr. Trigger wishes? Perhaps he considers no one can fill the "Aldermanic" bench—as he calls it—like himself, and if "talking" is the necessary quality he is probably correct. However, we find Mr. Carter has been elected twice, Professor Dewar three times, and Mr. Simpson no less than eleven times; the other three have only been once elected, and there are three Members of Council who have not yet had the compliment paid them.

Surely if a member of the profession is "good enough" to be elected to the Council by his professional brethren—especially when he is elected fairly and squarely, as Mr. Hunting calls it, without the aid of the Societies' co-operation and help—he ought to be well-known and "aldermanic" enough to be elected a V.P.

We should like to see a rule passed to prohibit the same person being elected a "Vice-President" for more than *one year* in succession, and also a rule to make it impossible for the same person to be "President" for more than *one year*. There always were "as good fish in the water as ever came out," and there need be no fear that there always will be. If Mr. Trigger and company were lost to us to-morrow, we should still find as good—if not better—men to carry on the R.C.V.S.

We agree with Mr. Trigger that it would be a good thing if the examination expenses could be curtailed, so long as the standard of efficiency is maintained. We understand, some years ago a "prominent" member offered to examine the students for *nothing* (and this is also done in other things, too), if only the Council would elect him, but this is not the sort of economy we want. An examiner should be up-to-date in knowledge, capable of doing the work, and determined to do it fairly to the student and the profession.

The number of the teaching schools will regulate itself, without the Council's interference. Let them all come, so long as they play the game fairly.

Our Diploma should certainly embrace the *right* to practice, but there is no earthly reason why *special* certificates or degrees should not afterwards be obtainable for special work. In fact, we would like to see the preliminary examination so planned, that by passing it the student would be able to take a degree in a special subject at any of our Universities, without having to undergo any further test in general knowledge, and we trust that the day is not far distant when some of our Univerities will recognise this.

After all, however, such degrees would only be a hobby, and give the holder of it a standing in certain educated circles. The public would never recognise it, and such academic persons would uot stand one iota better chance of getting a living as a practitioner than does the M.R.C.V.S. or even the "quack." Some quacks, registered V.S.'s, and the worst type of M.R.C.V.S. make far more money than some of the best of our members, and amongst certain classes even oust the latter altogether.

Mr. Trigger is delightful when he comes to the Registration Committee. He says "It was no use a man complaining if his statement was not accompanied by some sort of evidence. They could not deal with a complaint simply on the *ipse dixit* of a person who considered himself aggrieved." So far, so good, and it sounds very well; but it is not so long ago when one of the worst cases that has ever been brought before that committee, without a flaw in the evidence—and personal evidence too—was quashed and nothing done, simply because two of the committee would not agree, but gave no reasons, which simply makes the whole thing a farce, and all the profession ought to know and feel this. Then he goes on "Let the Council obtain any evidence of malpractices and they would not have the slightest hesitation in proceeding against the offender no matter who he was." The truth of this statement has been questioned before now in our public journals, and members of Council must not flatter themselves that they are the only people who tell the truth.

Mr. Trigger further says "they put their foot down most strongly in the case of any man canvassing—soliciting practice." Why we are told on all sides of this being done, and these individuals usually undersell their brother practitioners and obtain their clients, otherwise they would not succeed so often in these mean practices as they do.

The fact is, the Registration Committee is quite incompetent and too biased to deal with such subjects when *some* persons are connected with them; but if it is one of the "clique's" party or friends they will act fast enough, on the other hand they will "shield" and "let off" the worst acts one could possibly conceive any member of an honourable profession being guilty of when the opposite is the case, so what is the use of bringing any illicit actions before such a tribunal? We should welcome any rule which would *compel* a member voting against the majority to give his reasons for so doing if called upon to do so. Moreover, the majority should *always* rule the verdict, and the Council should be bound to punish a "guilty" person. If our Council has not the courage to punish a guilty man, they and the profession had much better leave the whole thing alone.

It is distasteful, to say the least of it, to hear members of Council saying they do not know their Vice-presidents—some of whom are better known than they themselves ever will be—and giving us to understand that justice is administered fairly and honestly by the authorities.

There is much that requires altering in the Council, as well as out of it, but this will never be done until new, unprejudiced, more open minded, and less cliquish members of the profession are elected to the Council in the place of some of the older ones, *and we cannot do better than make a start at the coming election.*—Yours truly, M.R.C.V.S.

COMMUNICATIONS, BOOKS AND PAPERS RECEIVED.—Messrs. G. Mayall, A. H. Jacobs, J. W. Marsland, J. L. Barling, E. L. Stroud, F. Spencer, W. A. Broad, E. White Wallis. "M.R.C.V.S." "South Country," "Tetanus."

Transvaal Agric. Jrnl., *Oil Engines*, by W. A. Tookey.